DOCUMENT RESUME

ED 203 277 CS 006 070

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TITLE Utilizing Oral-Motor Feedback in Auditory Conceptualization.
PUB DATE Apr 81
NOTE 18p.: Paper presented at the Annual Meeting of the International Reading Association (New Orleans, LA, April 27-May 1, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Auditory Discrimination: *Auditory Perception: *Beginning Reading: *Classroom Techniques: Cognitive Development: Grade 1: Language Acquisition: *Metacognition: *Oral Language: Perceptual Motor Coordination: Primary Education: Reading Instruction: Self Evaluation (Individuals): Sensory Integration: Teaching Methods
IDENTIFIERS *Auditory Discrimination in Depth Program

ABSTRACT

The Auditory Discrimination in Depth (ADD) program, an oral-motor approach to beginning reading instruction, trains first grade children in auditory skills by a process in which language and oral-motor feedback are used to integrate auditory properties with visual properties. This emphasis of the ADD program makes the child's perceptual observations more meaningful, and it trains children to give selective attention, to rely on more than visual helps, to note important characteristics, to be able to dismiss unimportant characteristics, to be capable of self-checking, and to see themselves as in control of their learning. The ADD techniques are designed to be used with Socratic dialogue (questioning) in homogeneous groups in a classroom setting. Steps of the program include conducting oral-motor activities in auditory awareness (applying labels based on the physical properties of the mouth action of language sounds), questioning behaviors by teachers that help students discriminate sounds, and building a rational framework for categorizing consonant and vowel sounds. (A report of classroom data indicating the success of the ADD program precedes the detailed description of the program.) (RL)

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UTILIZING ORAL-MOTOR FEEDBACK IN AUDITORY CONCEPTUALIZATION

Neuropsychological Issues in Reading

Special Interest Group

26th Annual Convention

International Reading Association

New Orleans, Louisiana

April 29, 1981

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UTILIZING ORAL-MOTOR FEEDBACK IN AUDITORY CONCEPTUALIZATION

When 1st grade children are trained in auditory skills by a process which emphasizes language and oral-motor feeling to integrate auditory properties with visual properties, unusual gains in reading achievement result.

This has been the enduring result of a program conducted for all 1st graders at the Arco Elementary School in Arco, Idaho from 1974 to the present.

The Woodcock Tests of Reading Mastery were administered on a pre/post test basis to a random experimental population of 1st graders in 1975, 1976, 1978, 1979, and 1980. Scores in total reading improved at a level of high statistical significance each year ($<.01$) with scores in 1978, 1979, and 1980 improving at a rate of $<.001$. Based upon a pre/post-test interval of seven months, "total reading" gains were 1.25 in 1978, 1.34 in 1979 and 1.32 in 1980. Other longitudinal data reveal that former project classes continued to score at the 92nd percentile on the reading subtest of the Iowa Tests of Basic Skills as second graders, at the 91st percentile of the same subtest as third graders, and at the 86th percentile as sixth graders.

In the years 1971-74, the average reading percentile score on the ITBS was 52nd percentile for grades 2 through 5. This contrasts to the scores for 1975-1980 for students who received auditory training as first graders. Their average percentile rank for the reading subtest of the ITBS during those years was 85.7 percentile.

When a chi square analysis for treatment over time was applied to the scores of students who had auditory training as first graders, and compared to those who had not, the results, significant at the $<$ .001 level, favored the students receiving instruction in auditory skills.

The vehicle for this mode of teaching is Auditory Discrimination in Depth (A.D.D.), Teaching Resources 1979 . The A.D.D. program differs from other programs in the manner in which emphasis is placed on the physical attributes of sound production, in the manner in which sounds are categorized and in the manner in which practice is given to develop the ability to deal abstractly with encoding and decoding tasks.

I

The A.D.D. program emphasizes techniques which make the child's perceptual observations more meaningful. Children are trained to give selective attention, to rely on more than visual helps, to note important characteristics, to be able to dismiss unimportant characteristics, to be capable of self-

checking and to see themselves as in control of their learning.

Both consonants and vowel sounds are presented by placing emphasis on several of the physical aspects of sound production. Since students tend to attend only to the most potent stimuli, the teacher task is to focus student attention on oral-motor feeling, and to foster the use of feeling as an important characteristic.

In this initial step - the feeling awareness (oral-motor activity) is combined with the auditory awareness (what sound was produced). Therefore, salient sound and movement/contact properties receive emphasis. The use of a descriptive defining label for each sound helps the child to conceptualize and retain the image of the stimulus by its characteristics.

The importance of having the label relate to mouth action can not be minimized. Labeling requires the child to dissect the central features of sound production and lays the ground work for deductions. The emphasis on applying labels based on the physical properties of the mouth action has personal relevance to the student because he can feel and observe the mouth action to verify the accuracy of the label. For example, /f/ and /v/ are called lip coolers and /th/ and /th/ are tongue coolers. Calling the sound /f/ the angry cat sound does not require much abstraction. But defining it by its attributes, quiet (unvoiced) lip cooler, does place it in the heirarchy of abstraction.

Questioning can involve the child actively in learning by asking him to assess and respond to situations. If the student seems confused or answers incorrectly, the question is not repeated. Instead, it is simplified by breaking it down into sequential components through a series of questions. The memory task is reduced by giving some choices. "When I say /$\overline{oo}$/ is my mouth round or smiling?" Building the child's skill through careful sequencing of questions shows the child that even tough problems can be solved.

Teacher questioning helps the student discriminate which qualities are important and which are irrelevant. A teacher skilled in questioning can direct the students' attention to important details. "When you said /ch/ did the air come out smoothly or did it sort of push out?" This allows the student to verbalize on ideas that were initially hazy. "What is the same and what is different about the way you produce the sounds /sh/ and /ch/" By stressing the mouth action and the resulting 'feel' of the lips, tongue and teeth as sounds are produced, the child adopts a mental set based on motor and auditory stimuli.

Visual clues are incorporated by having the student observe the appearance of the mouth as sounds are produced to determine what parts of the mouth are playing integral roles (lips, tongue, teeth) in the production of each sound. This awareness allows the student to self check for accuracy of

judgements. Not presenting a grapheme initially allows the oral-motor stimuli to be experienced with a heightened awareness.

When the teacher pronounces /p/, the student describes the action by saying something like: "I saw your lips go together and then come apart." The teacher fosters even greater selective attention by posing a comparative type question - "Did my lips come apart slowly or did they sort of 'pop' open?" "Put the back of your hand close to your mouth. Did the air come out smoothly, or did it come popping out?" The child experiences the oral-motor feeling of this phoneme and uses this feeling to evaluate the presence or non-presence of the sound in words or syllables. The teacher might ask the child to watch the teacher's mouth as phonemes /p/, /k/, /p/ or syllables /ap/, /pu/, /te/, are sounded. The child reports on whether he viewed the lip popping action and whether he could feel the lip popping action as he repeated the phonemes or syllables. This helps to foster the capability of evaluating new information against the system.

To this point, most examples have dealt with consonant sounds. However vowel sounds are equally applicable to all steps discussed. Vowels are also taught from a feeling standpoint. Although the mouth action is not as dramatic as for consonants, students can feel the drop in tongue placement as the sounds /ee/, /i/, /e/, /ae/, /a/, /u/ cause

the tongue to "take little steps down the front stairs" in the mouth. These 'steps' are emphasized and dramatized in several ways. The teacher demonstrates how her tongue "takes steps," while the jaw is dropping slightly for each sound. Attention is also drawn to the mouth shape engendered by these sounds - a smile.

After the smile sounds the jaw drops to allow the tongue to move lower for production of the /o/ and /au/ sounds: This eliminates the smile expression and replaces it with an "open" mouthed expression. Then the tongue lifts toward the back palate and the mouth becomes more and more rounded as the "round" sounds /oe/ /o͝o/ and /o͞o/ are produced.

The dipthongs (ie, ue, ow, oi) are identified as sounds which originate in one mouth shape and finish in another. For example, /oi/ begins with a round shape and "slides" to a smile. These sounds are called "sliders."

The techniques described to this point are aimed specifically at the development of cognitively directed perception through labeling which makes perceptual observation more conscious. Language was used by the student to describe the feeling of the mouth action and the observations regarding the mouth (lips, tongue, teeth) movements. This language was brought to a focus by condensing it into the label.

II

This stress on student description can help to develop many verbal concepts. Students describe sounds by their

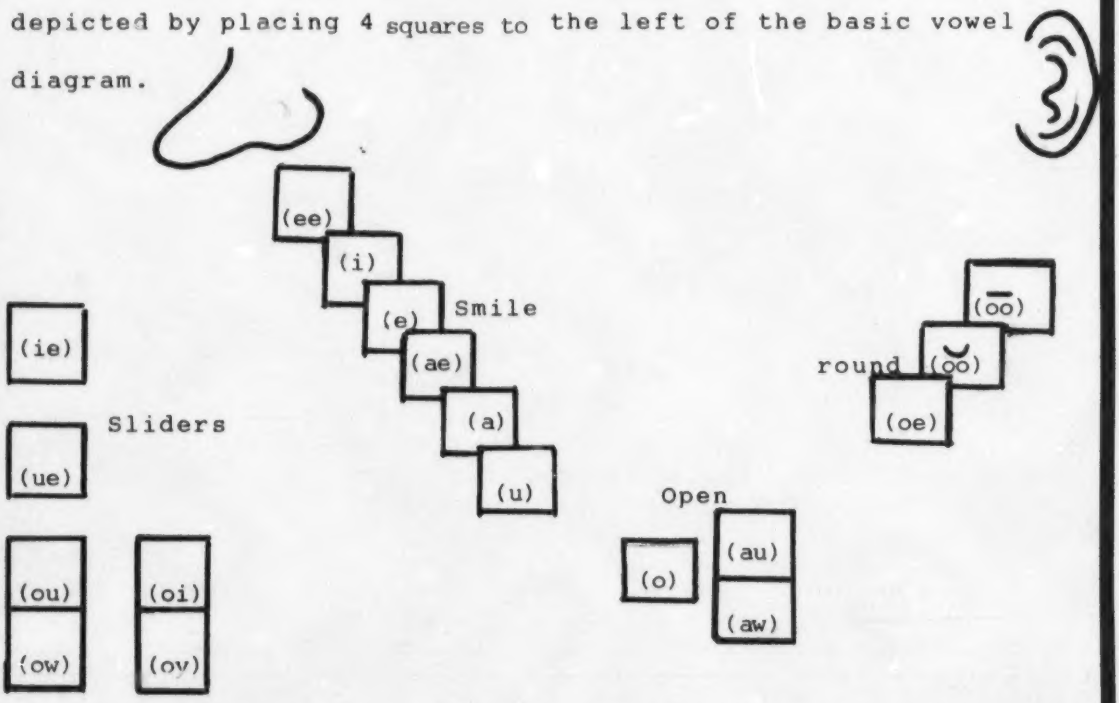
physical properties. They also handle multiple concepts by employing compare and contrast strategies when describing the samenesses and differences of sound production. They are able to establish some cause and effect relationships. "My teeth have to stay in contact with my lower lip for the sound /v/ to be produced."

Because of the continual use of language to describe process, a structure for the phonetic system can be established. This sense of structure gives the student a base - line strategy to apply to encoding and decoding tasks.

Student awareness of the physical attributes of sound production (as emphasized by labeling) is used to build a rational framework for categorizing consonant and vowel sounds. Sixteen consonants are placed in cognate pairs. The pairs are determined by identifying unvoiced and voiced phonemes which require the same mouth action to produce i.e. /p/ and /b/; /t/ and /d/; /f/ and /v/. Eight other consonant sounds are placed into three groupings ([m,n,ng] [l,r] [w,h, wh]) because of a characteristic held in common - to whit ([nose sounds] [tongue lifts] [wind sounds]). This framework forms the rationale for student observation and contingent behavior. When the child gives a correct observation "The sound /b/ is a voiced lip popper." -he needs also to be able to answer "How do you know its a voiced lip popper?" This skill requires the child to dissect the central features re-

sponsible for his observation and lays the groundwork for deductions.

In addition, a non verbal model of vowel sounds is placed on display and is then discussed until it transfers into the verbal language system. The model consists of placing colored squares in a pattern which depicts the tongue placement for each sound's production. Sliders are depicted by placing 4 squares to the left of the basic vowel diagram.



Graphemes are not associated immediately. As with consonants, the emphasis is to operate from oral-motor feeling and auditory points initially. When the association of oral-motor feeling and sound is firmly established, the student has a "reality" which can then be associated to the visual counterpart - the 'spelling' of the sound. When students

become fluent with the feeling, sound, and label for consonants, graphemes are introduced. When the student becomes fluent with the organization, sound and feeling for vowels, spellings for those sounds are introduced.

Because of this ordered array, students may 'touch vowels' and feel vowels and sense the order and contrast of the vowel system. Since the position of the color, not the color itself, determines the sound, students can be asked to produce the sounds in forward sequence, in reverse sequence and at random. In addition, the teacher can produce vowel sounds and have the student point to the appropriate feeling position on the visual display.

III

How does all of this effort create more effective problem solving in encoding and decoding skills?

Practice in problem analysis helps the child avoid resorting to impulsive trial and error. This skill must be grounded in other skills - memory through imagery, flexibility deductive reasoning and use of non-visual modalities.

First of all, memory development is facilitated. In other systems of phonics teaching, sound-letter association is taught as a highly visual task in a seemingly random fashion. By stressing feeling-which is always present and verifiable - and sound association, and by emphasizing the order of the system (consonants grouped by similar production features, vowels arranged in their physical relationship)

the phonetic system can be internalized in meaningful ways. Because feeling relates to sound and they can both then relate to the visual representation (graphemes), the memory system is provided with a cross index of ways to store information and to retrieve stored information.

Memory training tasks can help in the internalization of the phonetic system. Teacher questions or commands must be retained and responses executed. Material covered in previous or present sessions can be reviewed. The review of previously learned material can help the child select from the past to enable him to generalize to the present and to the future. "You know how to feel the consonant and vowel sounds. When we put them together in syllables do you think you will still be able to feel each sound?"

The separate phonemes are only the units of syllable building. They attain their full meaning not in isolation, but when they are embedded in context. To be able to use phonic knowledge for problem solving (encoding and decoding) the child must be able to employ sustained sequential thinking. He must maintain concentration and flexibly shift from one mode (feeling, auditory, visual) to another. Each teaching lesson can be designed to interrelate those modalities. Students then use imagery, selection of alternatives, and validation by verbalization to choose the possible and probable responses.

Another problem solving skill developed is cause and

effect reasoning. As students become fluent with the feeling and sound of phonemes they can move to identifying the number and order, sameness and difference of sounds in spoken syllables. They can verify for themselves the sequence of sounds in spoken syllables by checking the sequence of feeling.

Students use colored blocks to code syllable patterns. The blocks show how many sounds were made and whether the sounds are the same or different. For example 'pop' would be shown by 3 blocks with the first and last blocks the same color.

Students begin coding VC, CV, and CVC syllable patterns using just two sounds (ap, pa, pap); then move to VC, CV, CVC patterns where sounds many be added, shifted, repeated, substituted or omitted. (a, ap, pa, pap, pip, ip).

Using colored blocks to encode sound sequences develops the student's ability in sequential ordering. Instead of operating from a visual mode and from a whole to part plan ("This is the word ball. The first sound in ball is /L/".) the student operates first from a feeling and auditory standpoint and analyzes the portions of the whole. Because the sequences are developed based on the number and order of sounds, including awareness of sameness and difference, the

the child is learning the initial steps of logical, sequential thinking.

Students are to verbalize each step. Verbalization requires the student to be "tuned in" to the task. It also helps establish the pattern for inner vocalization which will take over when the process becomes less abstract through practice. It provides an auditory pattern which aids the teacher in observing the validity of the child's judgments. Because the visual pattern is in place for each sound in the syllable (the placed blocks) the teacher and student can test the validity of each judgment by noting sequence of phoneme feeling and checking that feeling sequence against the non-verbal visual pattern afforded by the blocks.

Sequence example:

Teacher: Show me /va/.

Student: (places blocks)

"/va/ lip cooler, smile /a/."

T: If that says /va/ show me /av/.

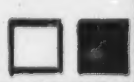
S: (Makes error - adds a block).

"Add smile /a/."

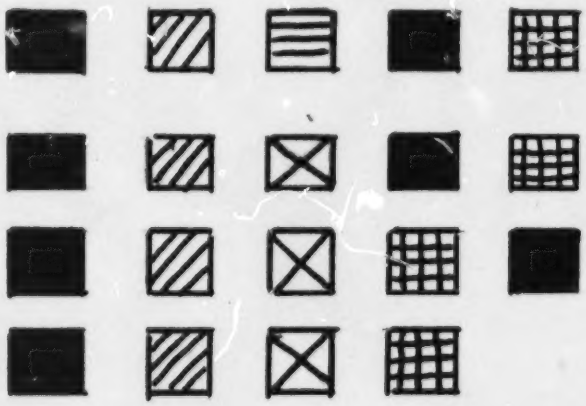
T: When you had /va/ (show block pattern)

you said you could feel a lip cooler and a smile sound. Now say /av/. Do you still feel that lip cooler first?

S: /av/ - No - Now it's coming last, I need to shift the lip cooler to the end. (adjust blocks)



Dialogue such as this helps to clarify hazy areas for the student. In addition it helps the child recognize, using his own knowledge, a correct statement from an incorrect one. By listening, checking and responding, the student is developing the receptive aspects of verbal communication. When simple syllables like those above can be coded with the colored blocks, complex syllables can be undertaken.



(spist)

(spest)

(spets)

(spet)

When the student becomes fluent with sequencing syllables by feel and sound, graphemes are again brought into use. Now the student is faced with selection of alternative spellings. The student is able to pause and reflect on alternative courses of action "Should /pale/ be spelled pale, pail, pael, payl? Which ones do we use?" Observation of the possibilities for various spelling patterns helps to develop flexibility as the child's thinking becomes freer with the awareness that

alternatives do exist.

Students learn that appropriate responses can cover a wide range of possibilities; some nearer to the mark than others. Through spelling a number of letter combinations the child can see that the same solution can be used for different problems. The student learns to recognize those solutions which are probably incorrect. In our example of possible spellings (pale, pail, pael, payl,) the student can recognize that two spellings are likely to be inappropriate (pael and payl) and can discuss why they would be less likely than pale and pail. The meanings for pale and pail are then discussed and the visual image of each word is related in a sentence context. Visual imagery is also brought into play for words containing silent letters or unusual spellings. "When I pronounce the word lamb , do I feel sounds to match all the letters I see? Will I need to make a visual memory for any of the letters?"

Deductive and inductive reasoning requires the child to move beyond the concrete, observable experience, make a generalization, and use that generalization to make a new deduction.

> "If there are 114 pages of words in the dictionary that begin with the letter c and only 10 pages of words that begin with the letter k, will a word that starts with the /k/ sound be more likely to begin with a c or a k?

Lets find out what causes some words to start with k."

IV

The goal of abstract thinking is to have the student independently bring forth mental skills and effort to meet the demands of the problem. When a task is being learned much mental effort is required. When, through practice, the mental skill is established, it no longer takes such mental effort and it is no longer abstract. As new or more complex tasks are introduced - syllable and multi-syllable encoding and decoding - memory is taxed and the student is impelled to resort to inner vocalization. The A.D.D. program's requirements for verbalization of process through all steps gives the student a practiced model which can then be applied independently as inner language to direct abstract thinking.

One goal of reading instruction is to produce a student capable of sustaining independent work. The A.D.D. program can develop cognitive skills which the child can internalize and use independently. Abstract thinking is not independently functional if external support must constantly be supplied. The ability to work independently may be developed through sequential repeated practice of the aforementioned techniques. Instead of relying on its incidental emergence, all students can benefit from these activities designed specifically to develop independent thinking and reasoning skills.

The students develop heightened facility at each step which leads them to increased concentration, maintainance of

set, categorization and simultaneous consideration of several elements.

The techniques outlined are designed to be used with homogeneous groups in a classroom setting using Socratic dialogue. The basis for such dialogue is questioning. The teacher who develops effective questioning strategies can lead the children to discover for themselves, through oral-motor feeling and auditory skills, the foundational principles upon which our reading and spelling systems are based. Students can then apply the processes necessary to help them THINK about how to read and spell words, rather than being dependent on rote memorization.